

7/ The aperture for earth observation is a small aperture which during observation of fainter stars preferably avoids interfering scattered light from the earth, and attenuates intensive sunlight which occurs at times when the sun appears in the beam path to the earth. The image of the earth through window 7 and the images of the stars through window 6 are superimposed on the image pickup devices.

IN THE CLAIMS

Amend the claims as follows:

18. (Twice Amended) A combined earth-star sensor system for three-axis attitude determination and orbit tracking of a satellite in space, said combined earth-star sensor system (1) comprising separate apertures with different directions of observation of earth and stars to receive light from the earth and stars, having respective levels of brightness and common image pickup devices (4) for the earth observation and the star observation, and an evaluation system for determining attitude and orbit of the satellite in which star tracking is achieved by means of a star catalog.

20. (Amended) The sensor system according to claim 18, comprising an optical arrangement (9) for star observation, an optical arrangement (10) for earth observation and a semitransparent beam splitter (8) between said apertures and the optical arrangements for deviating laterally entering light from

the earth and transmitting light from the observed star, to the image pickup devices (4).

31. (Twice Amended) : A method for simultaneous orbit determination and attitude determination of a space vehicle, comprising:

simultaneously forming images of a star and the rim of the earth in one

focal plane of a sensor system;

determining attitude of the star in said focal plane;

determining the rim of the earth by image processing;

determining rates of rotation of the sensor system from movement of the star image in the focal plane; and

calculating at least one of orbit and altitude of the space vehicle carrying the sensor system, wherein an evaluation system of the sensor system carries out star tracking by means of a star catalog.

Add the following new claims:

37. (New) The sensor system according to claim 18, in which tracking of the rim of the earth comprises image processing means.

38. (New) The sensor system according to claim 18, including means for variable control of exposure time of earth and star observations by said common image pickup devices depending on the brightness of the earth and the stars being observed.